

How does convection moisten the upper troposphere?

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Weinstock et al.

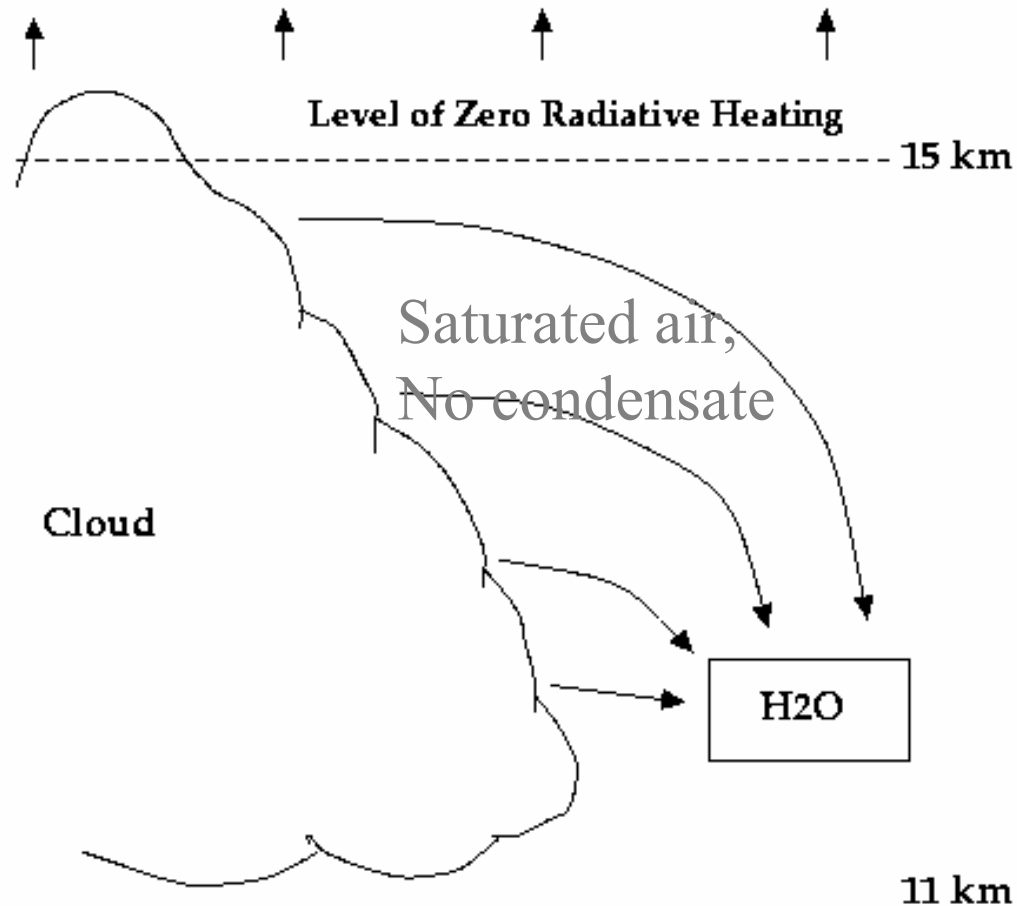
Baumgardner et al.



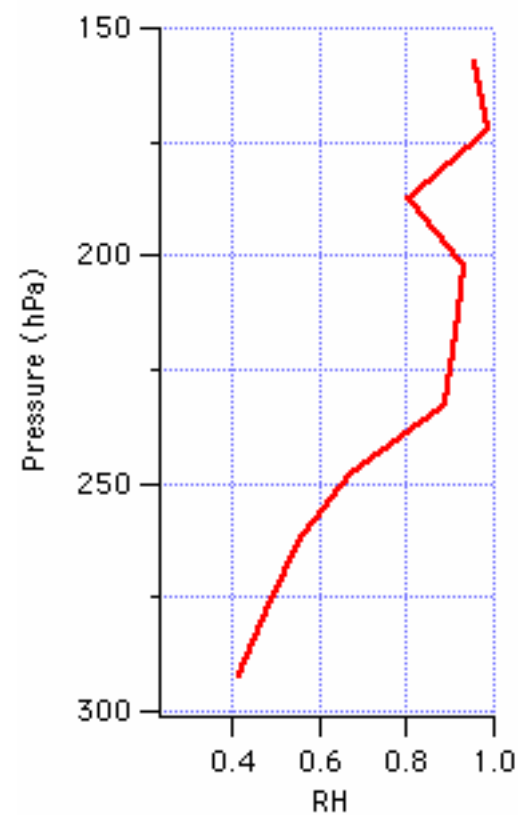
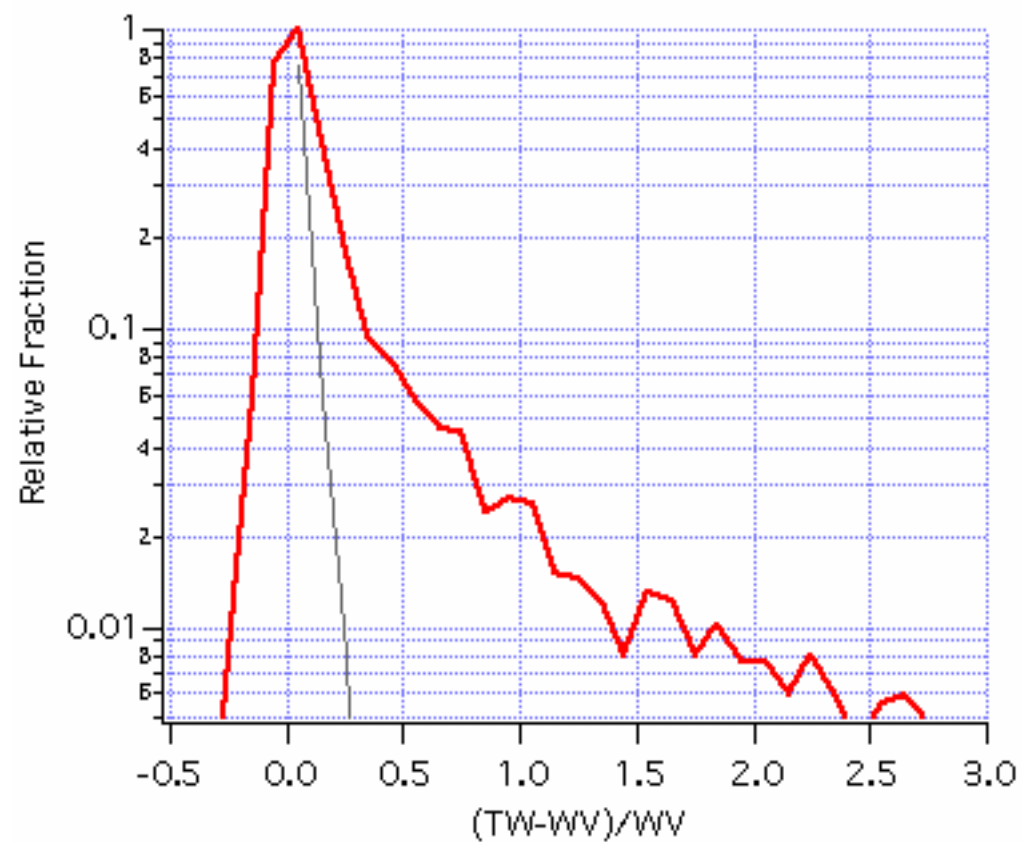
“We expect that most of the analyses presented will be at an intermediate stage.”

- The Crystal Brain Trust

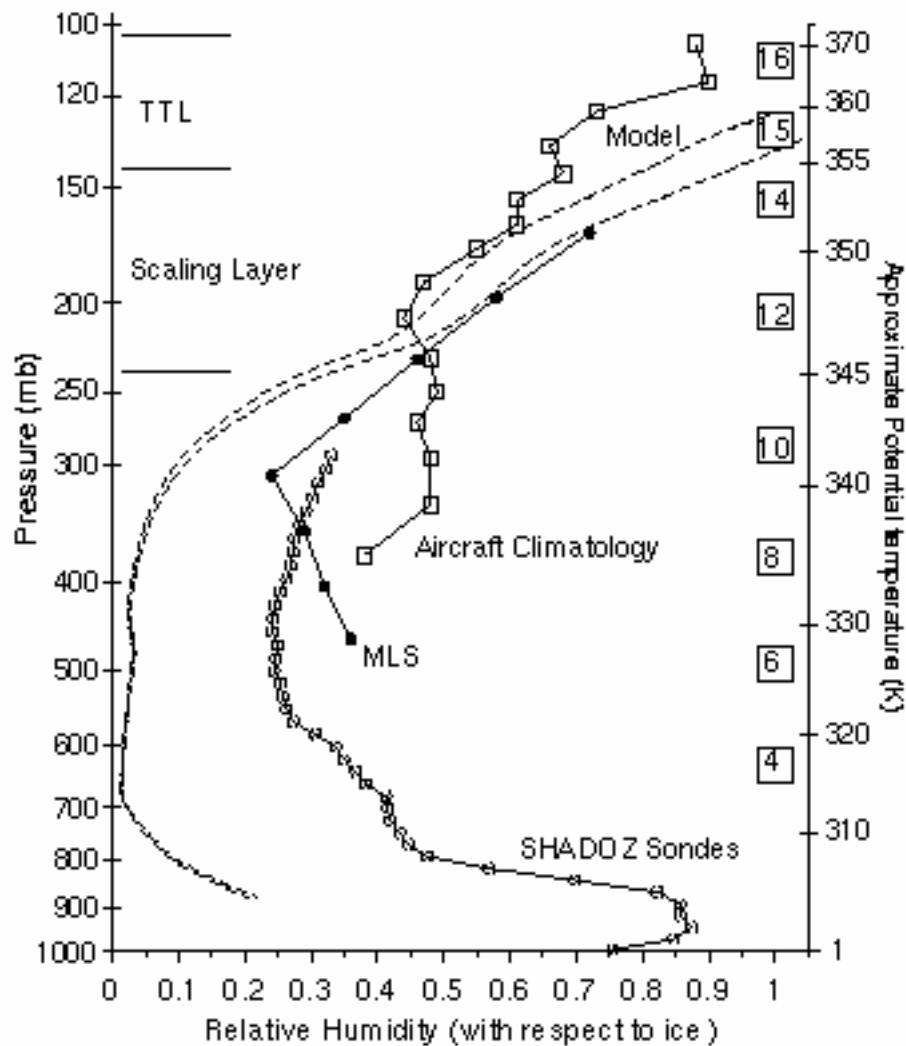




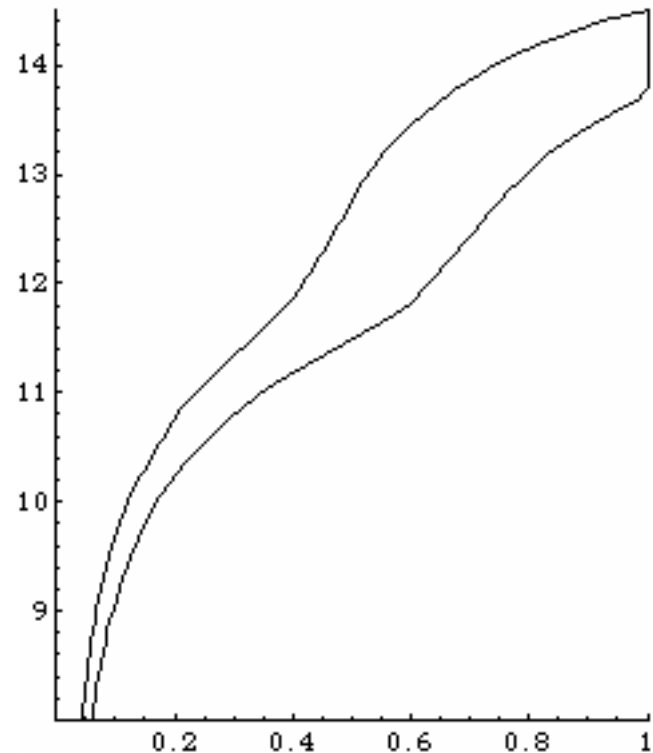
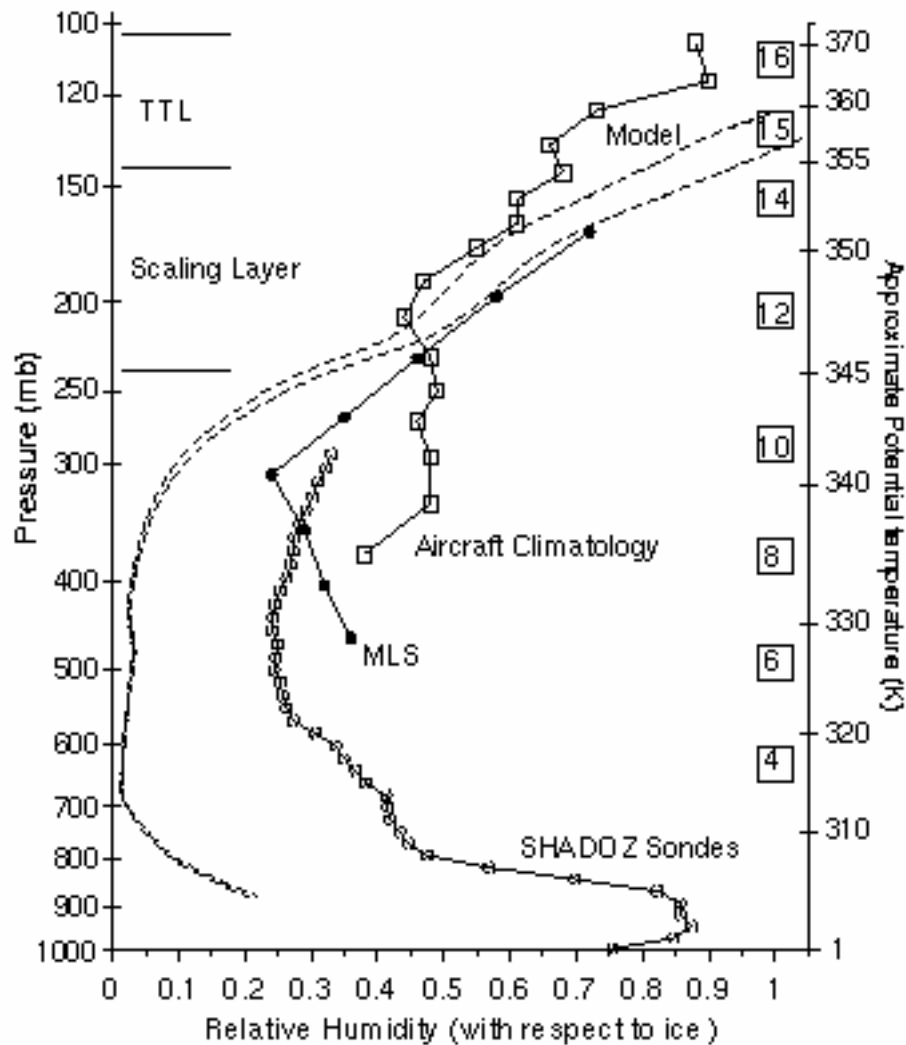
Sherwood, 1996; Salathe and Hartmann,
 1997, 2000; Pierrehumbert and Roca, 1998;
 Dessler and Sherwood, 2000;
 Gettelman et al., 2000; Folkins et al.,
 2002

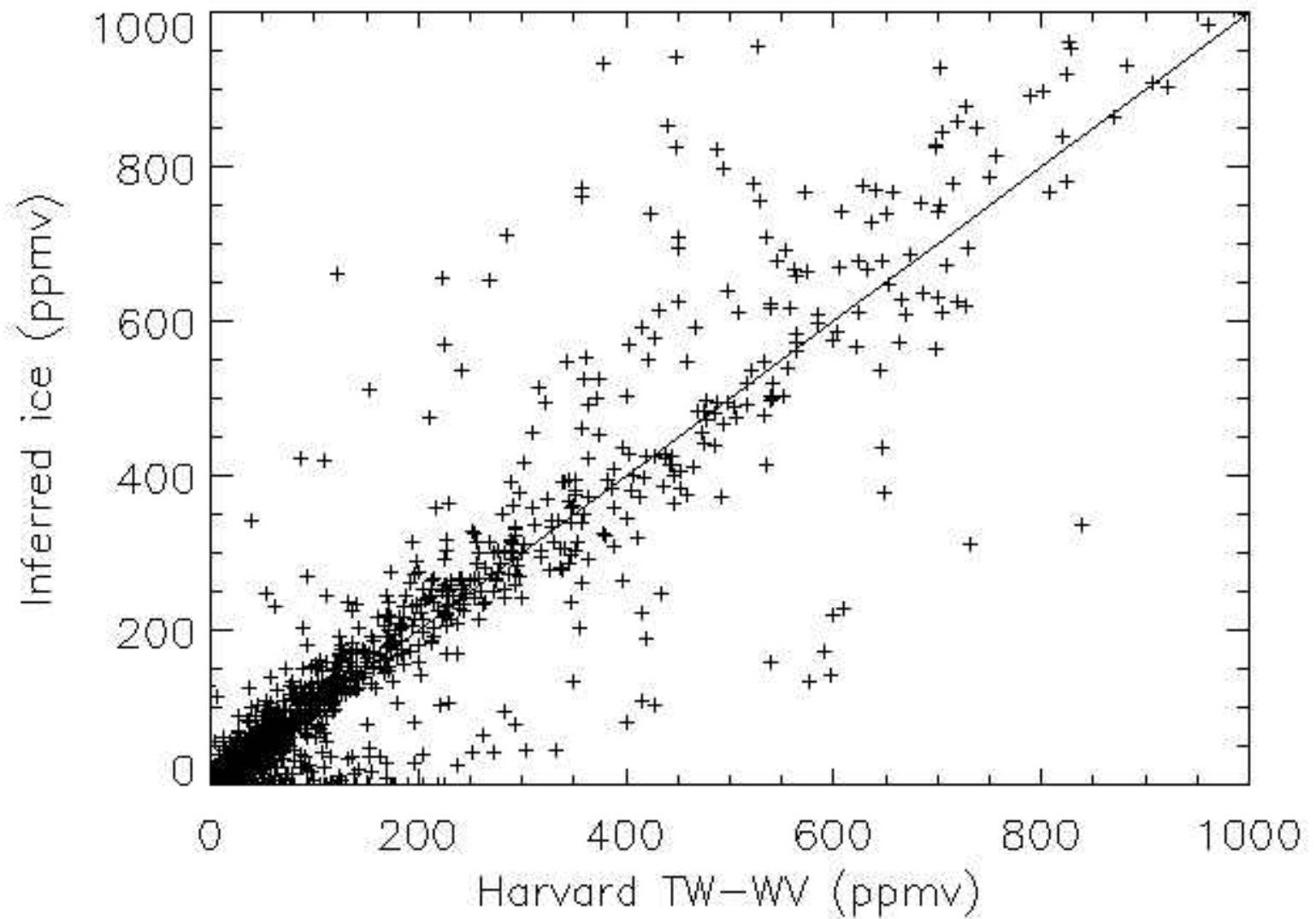


Folkins et al., 2002

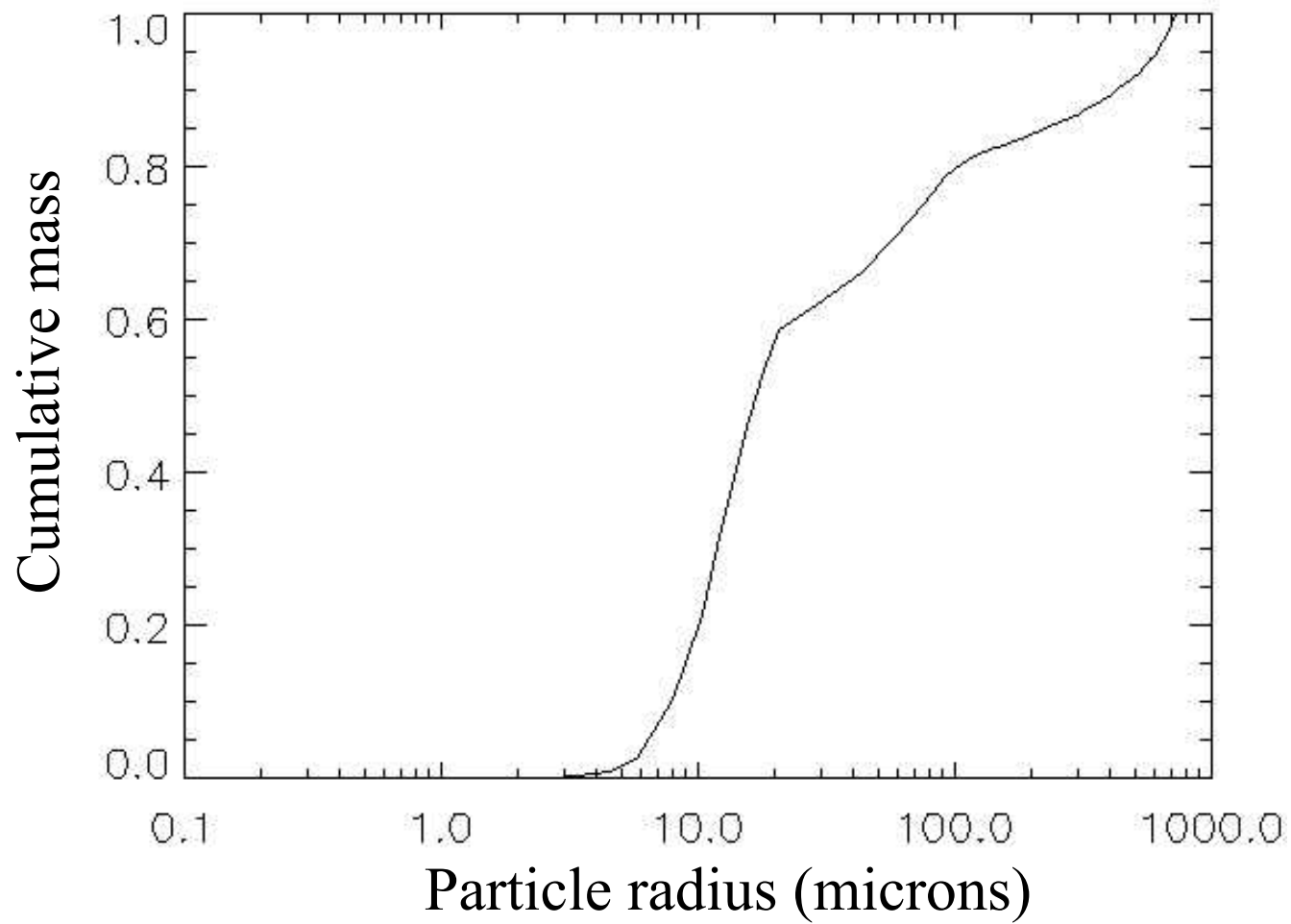


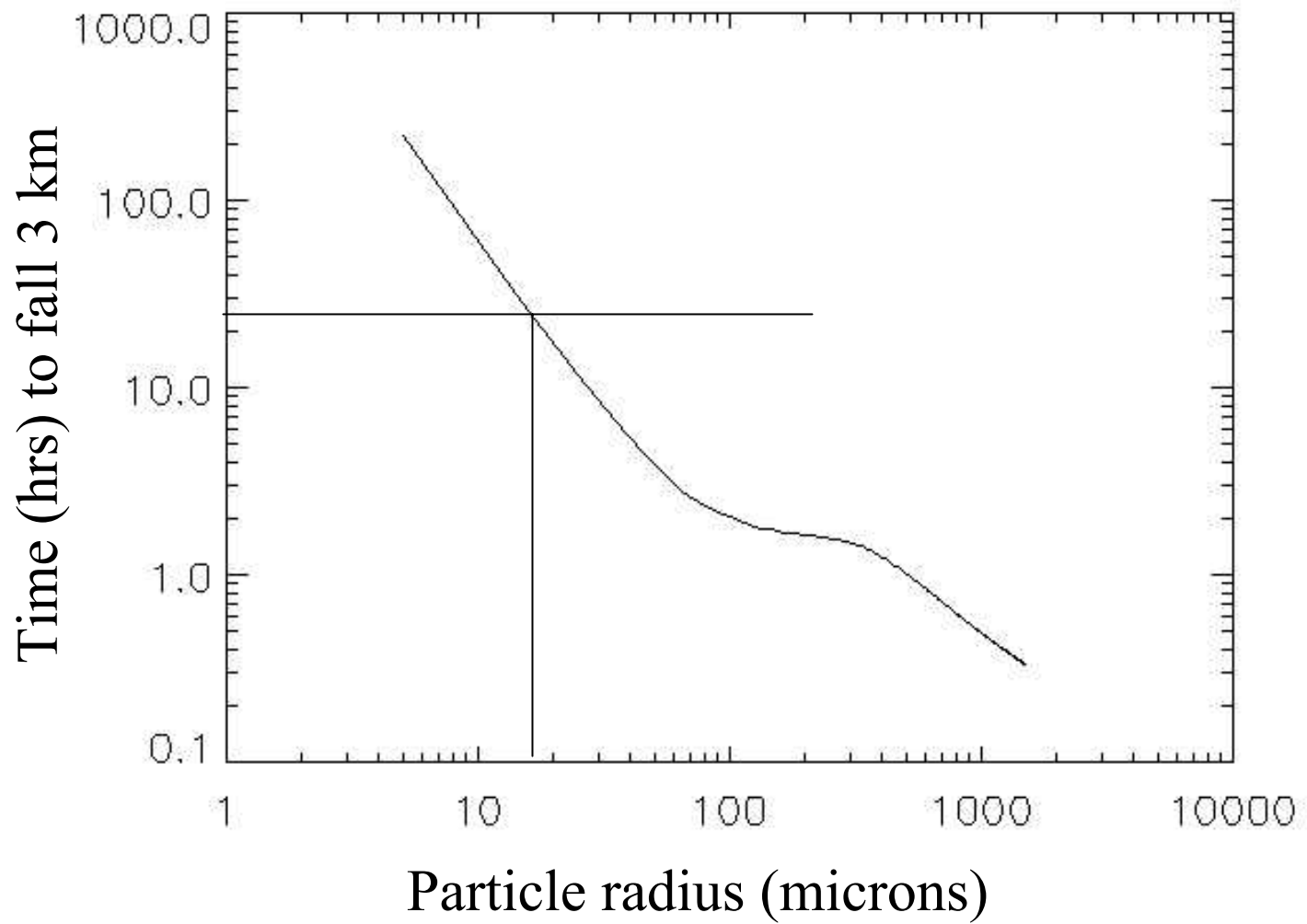
Folkins et al., 2002

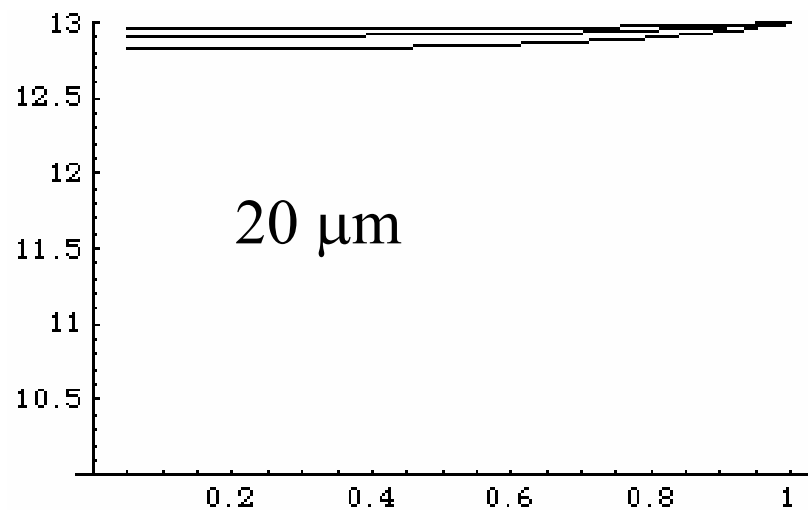
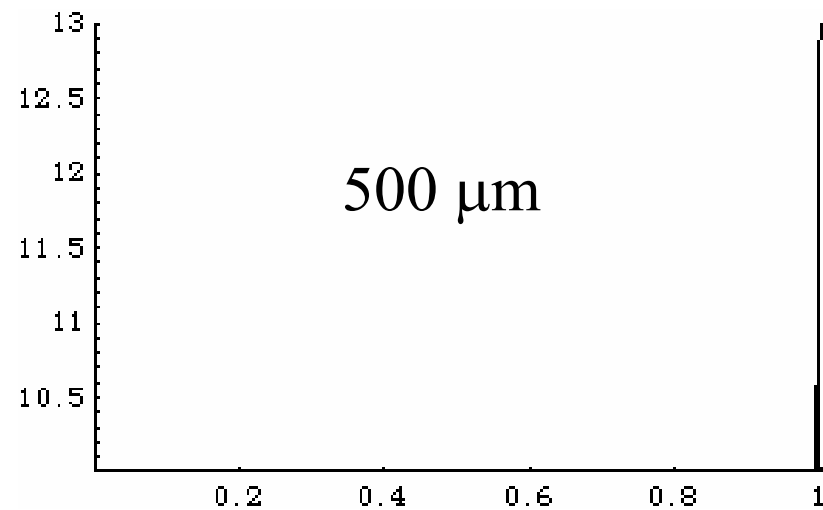
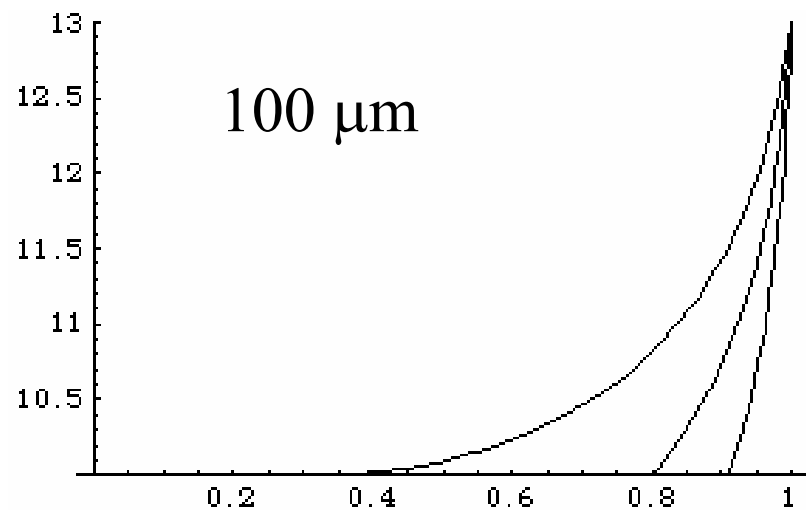




$$\rho = 0.93(0.05 + 0.95e^{-r/90})$$







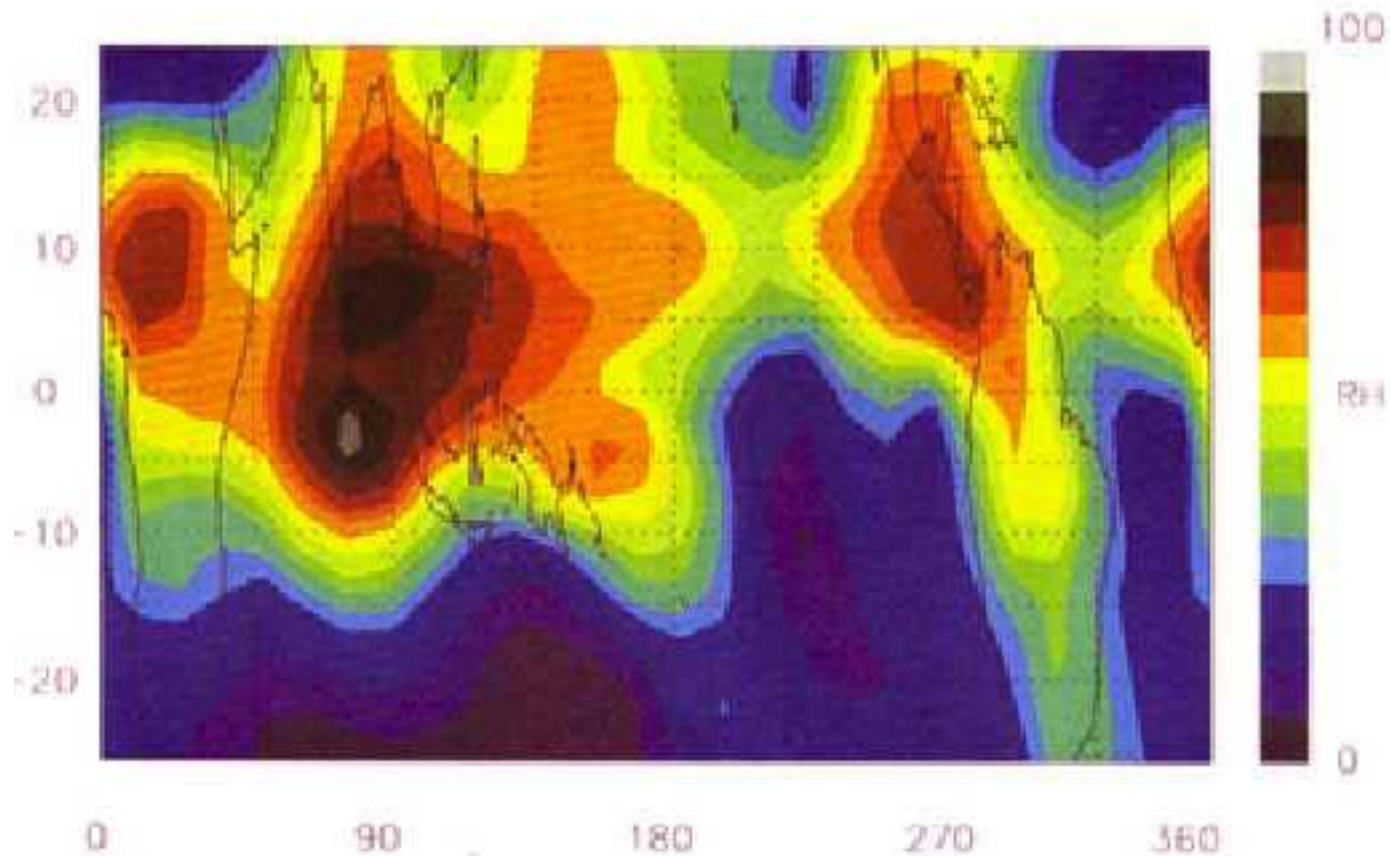
Preliminary conclusions

- Measurements show significant amounts of water in the UT in the form of ice
 - Most of the mass will either fall or evaporate within a few hours
 - Simple model indicates that this ice might significantly moisten UT
 - Not clear how to resolve this with other analyses

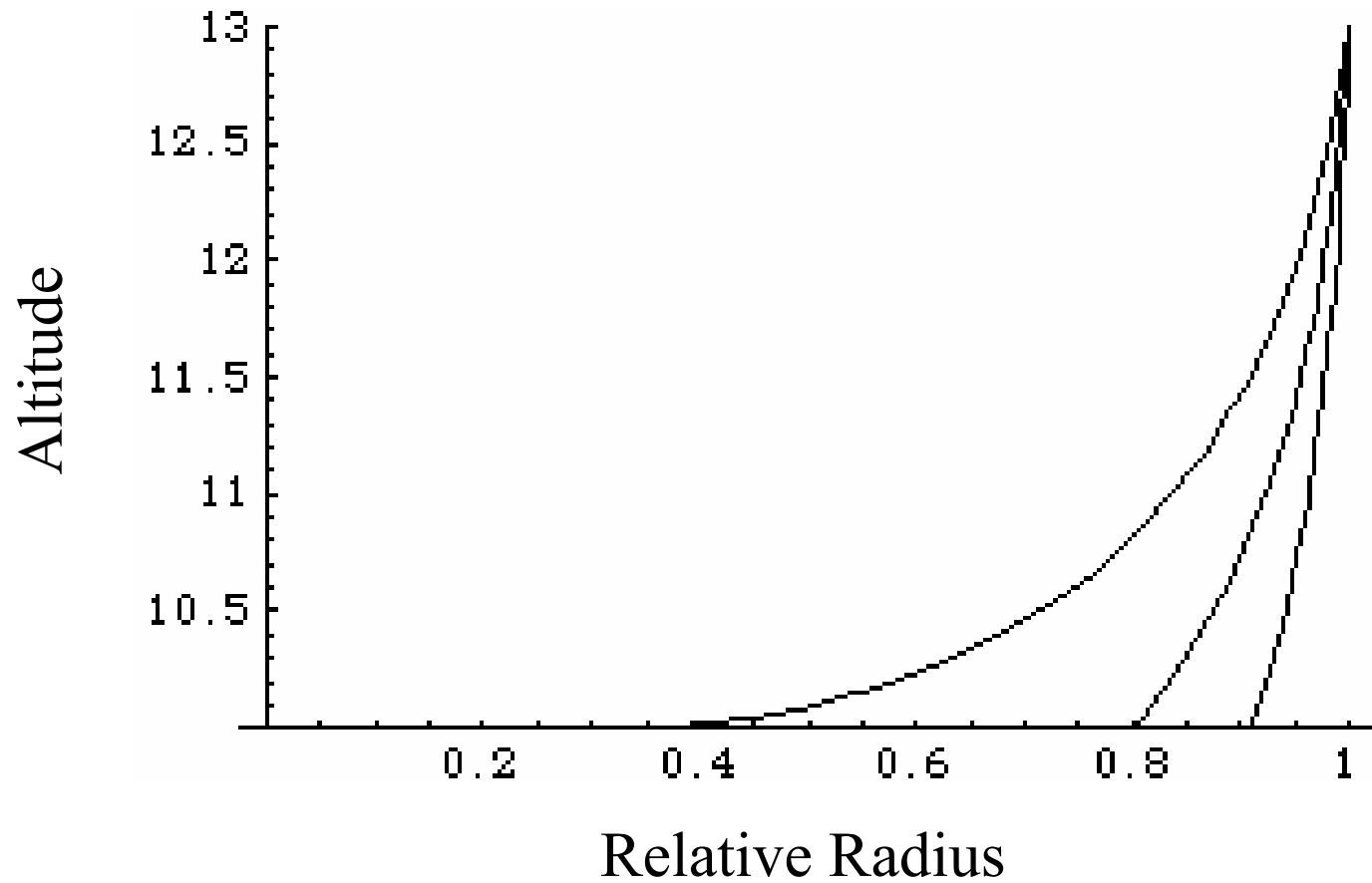
Next steps ...

- Use unified size distributions, IWC
 - Isotope data
 - Trajectory simulations using MM5 winds, humidity
 - Incorporate non-spherical particle physics
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- We acknowledge support from the CRYSTAL-FACE program

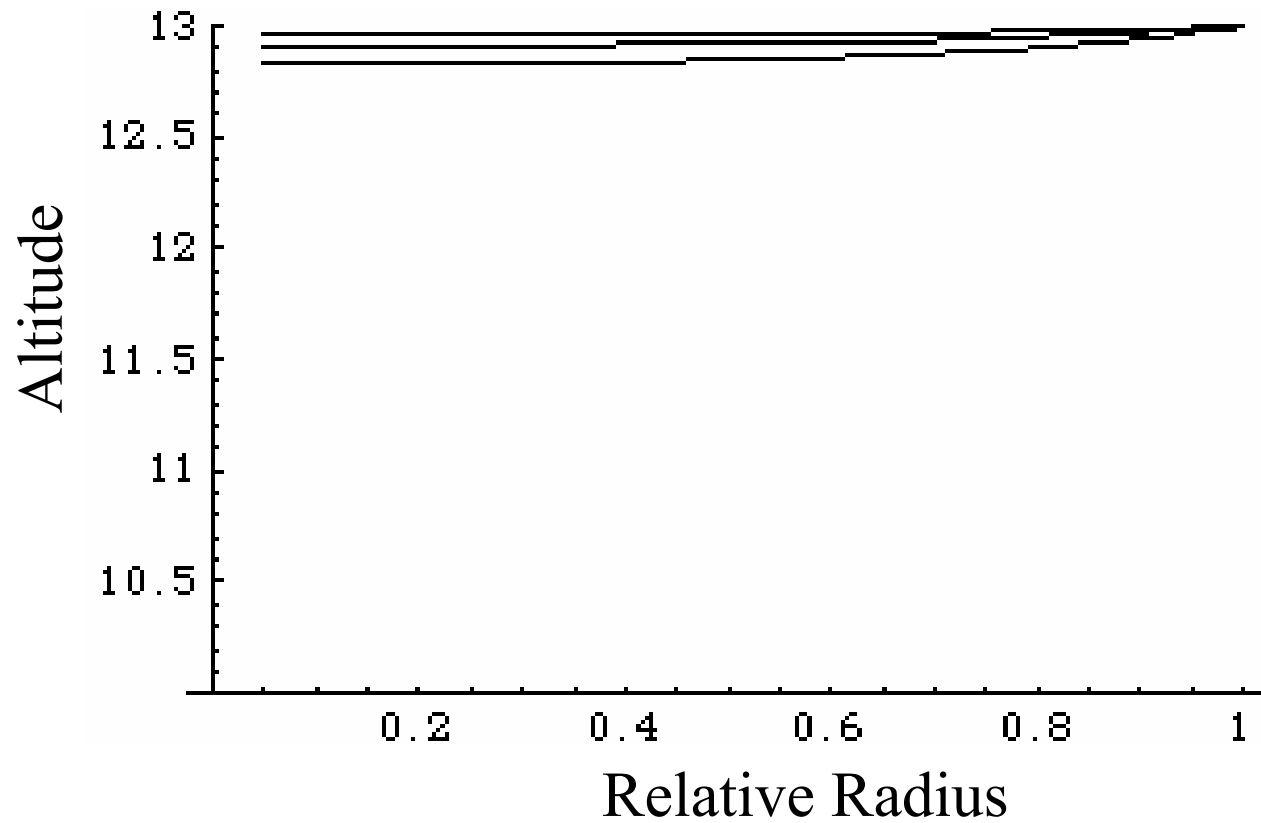




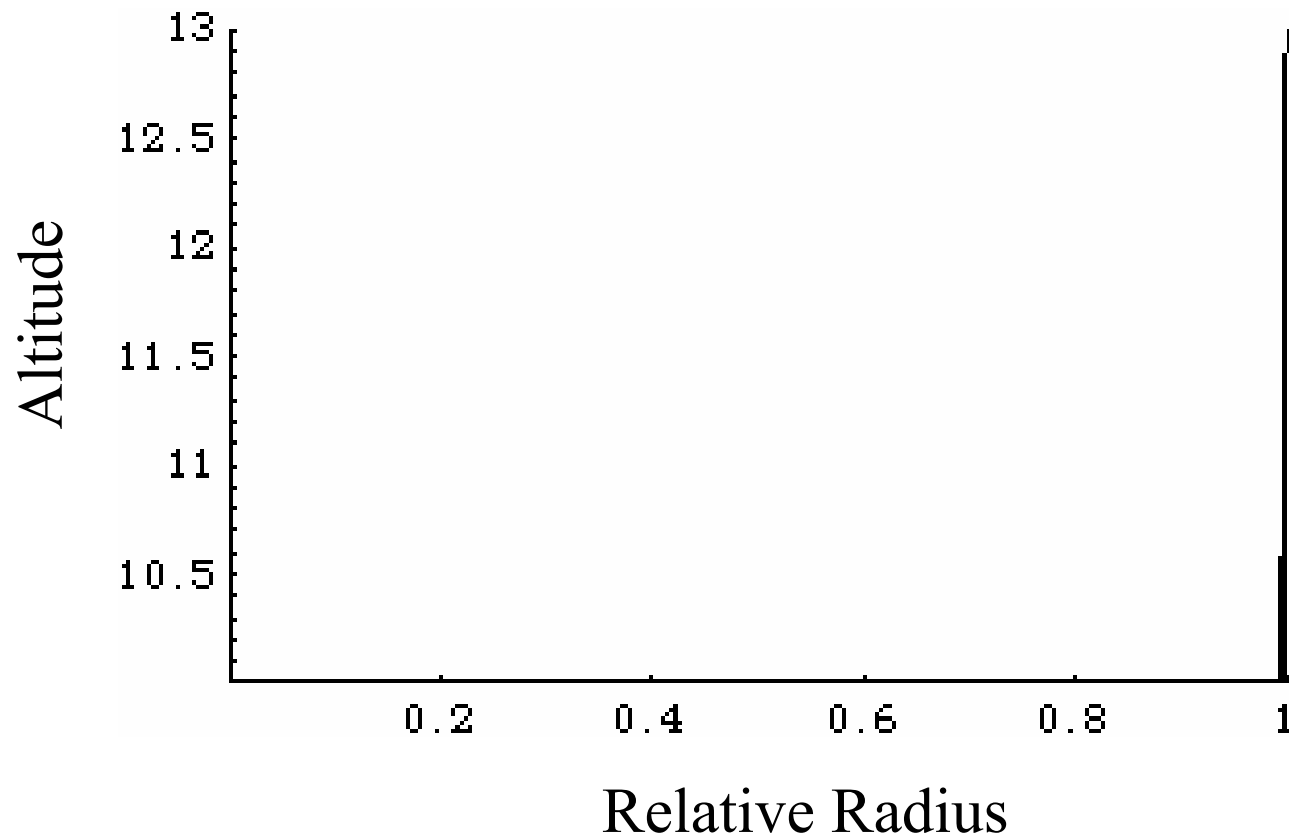
UARS MLS UTH, v4.90, Aug. 1992, 215 hPa
[Dessler and Sherwood, *JGR*, 2000]



100 micron particle



20 micron particle



500 micron particle